Improving rural welfare and optimising aggregate efficiency

Can China have both the fish and the bear paw?

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Introduction

Chinese policymakers face a conundrum: how to achieve welfare improvements for rural communities and simultaneously build a 'well-off society' for both urban and rural citizens. Both these goals are set out by the Chinese government in its two most recent 5-year plans. The support of rural incomes in China has historically been achieved through high price floors on major staple grains and subsidies on inputs and outputs. However, high price floors and restrictive trade policies raise prices for consumers, and price support schemes and subsidy payments to farmers come at a cost to taxpayers. This means that the current approach of advancing the welfare of rural households is constraining others in the economy, bringing it in conflict with the second government objective of building a 'well-off' society.

Agricultural policy interventions are generally bad for the economy

The ongoing existence of domestic agricultural subsidies, trade barriers and other market interventions in many of the world's economies, including China, suggests that that in order to achieve better economic outcomes there is still much work to be done to understand and advance awareness of certain economic principles. Such principles relate to the adverse effects of distortionary agricultural policies, even in the constant, if not dominant, presence of political economy considerations that influence policymakers' decisions. These principles also help to understand and compare the performance of different policies against equity and efficiency measures, as is done later in this paper. For that reason, some basic economic concepts are described briefly below. The political economy considerations are not pursued in this paper.

Social welfare is maximised when the private marginal benefit of the buyer meets the private marginal cost of a seller. From that point, no further gains from exchange can occur because the additional benefits are less than the additional costs to the economy. Any interventions like subsidies or taxes (or price floors, which are of particular policy relevance to China's agricultural sector) alter these incentives and result in an inferior outcome. The exception to this is when private marginal costs and benefits diverge from social marginal costs and benefits, i.e. in the presence of externalities. An example of this is pollution-emitting production, where social marginal costs exceed the private marginal costs.

In the presence of externalities, governments can intervene in markets to nudge private marginal costs and/or benefits towards social marginal benefits and/or costs. To continue the example above, consider a pollution emissions tax. The aim of the tax would be to incorporate the social cost of the economic activity into individuals' decision making. In the absence of externalities, government interventions in markets, such as trade restrictions and domestic price support mechanisms, generally have adverse effects on overall economic welfare.

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[1] This is a play on a Chinese expression, akin to a play on an English expression, "Having cake and eating it too".

China's current policies support rural welfare

The principal trade policies maintained by China are tariff-rate quotas (TRQs) and tariffs (OECD 2020). Their principal domestic policies are currently price floors, subsidies and a target price policy. These policies are outlined briefly below. This is not an exhaustive list and a number of subsidies not explored here are paid to growers, including seed subsidies and crop insurance subsidies. China has also maintained a policy of import diversification for a number of years (Government of China 2017, 2019, 2020) but the implications for economic efficiency and equity of this policy are not explored in this paper.

TRQs

TRQs are maintained for corn, cotton, rice, sugar and wheat (WTO 2021). However, large portions of these TRQs are reserved for state trading enterprises (STE), whereby the government controls or restricts access to portions of the TRQs. A World Trade Organization dispute was raised by the United States in 2016 about whether access to the TRQs was transparently administered (WTO 2020). Transparent administration of TRQs is important because if importers are unable to freely access a quota, then the true quota volume may be effectively smaller than the announced volume, reducing potential gains from trade.

Tariffs

Low most favoured nation (MFN) tariffs are in place for barley, sorghum and soybeans (less than 10%, WTO 2021). However, China has applied restrictive trade measures on major exporters of barley (Australia) (Cao & Greenville 2020) and canola (Canada) (Dahl 2020). Regardless of the reasons for these measures, the restrictions limit Chinese consumers' access to these imported commodities. Additionally, since these measures target major exporters of these grains, theory suggests that the effect will be upward pressure on consumer prices.

Price floors

Price floors are maintained for rice and wheat (OECD 2020). The government maintains these price floors by offering to purchase farmers' rice or wheat at a set price, known as the floor price. It then stores the grain in stockpiles. The floor price can be announced before, during or after planting. The timing of the announcement is important because it can influence production (planting) decisions. However, irrespective of timing, farmers are likely to expect price floors each year, given how long the policy has existed.

The price floor policy for corn was abolished in 2016 (Fell & Waring 2017), and for sugar in Guangxi province in 2019 (OECD 2019). The abolition of the corn price floor followed the accumulation of an estimated more than 200 million tonnes of corn (USDA-FAS 2021). This accumulation highlights the adverse economic effects of such price floors: i) production volumes become unnecessarily higher than what is otherwise demanded in the economy, meaning that scarce resources are allocated to inefficient production choices, and ii) taxpayers make significant transfers not just to producers (through the purchase of excess grain) but also through the maintenance of stocks, which are costly to maintain.

Acreage subsidies

Acreage subsidies are now paid to corn growers by the provincial governments (USDA-FAS 2020a). While these subsidies are not directly linked to production, they are still distortionary because they are expected by growers. This is because land (acreage) is a major production input and the subsidy encourages the use of that land for a given activity (e.g. corn production) when it could otherwise be used to produce greater value to society (e.g. production

of more valuable crops). The subsidy creates deadweight loss in society, with the expense borne by taxpayers outweighing the additional producer surplus accrued to producers.

Acreage subsidies are now also paid to soybean growers by the provincial governments (USDA-FAS 2020a). These subsidies replace the target price policy, which was run as a trial until 2017 (OECD 2018).

Target price subsidies
The 'target price' policy is still maintained for cotton in Xinjiang province (USDA-FAS 020b, USDA-FAS 2019). Essentially the provincial government pays the difference between the market price and the pre-announced target price. A volume limit is placed on the government's purchases but this has never been binding. In other cotton-producing regions of China, provincial governments pay an acreage subsidy.

Cotton stockpiling
The government boosts nationwide cotton prices through purchases for a cotton stockpile (USDA-FAS 2020b). The government purchases domestic cotton during the harvest period at an announced reference price. When the domestic price reaches CNY800/t (approximately $160/t) higher than the government's international reference price, the government ceases purchases for several days. Similar to the grains stockpiles, maintenance of the stockpile imposes a cost burden on taxpayers.

Analysis of these policies
The support policies described above are maintained by the Chinese government despite the well-known adverse effects of distortionary policies on broader economic welfare. This runs counter to the Chinese government's objective to build a well-off society. Nonetheless, economic theory, as noted above, argues that interventionist policies may support the goal of improving rural welfare. This is consistent with basic partial equilibrium economic theory—that producer surplus is boosted by policies that raise producer prices (albeit at a cost to taxpayers and consumers). An important policy question for Chinese policymakers is how to achieve both objectives simultaneously, rather than one at the expense of another. The performance of different policies and solutions to this policy question can be obtained through a re-purposing of already-available results produced in computable general equilibrium (CGE) modelling by Cao et al. (2020) and Cao & Greenville (2020).

Welfare improving policy alternatives are available
Cao et al. (2020) investigated the effects on key economic variables of alternative policies for China's major crops (corn, rice and wheat). The modelling simulated the economic effects of different agricultural support policies on the price volatility of these crops using the ABARES CGE model. This is relevant to the discussion in this paper because the authors initially conducted the simulations without price shocks, to focus on just the simple effects of alternative policies.

The model used by Cao et al. is documented in the same publication and is based on a model developed by researchers at the Partnership for Economic Policy (PEP) (Robichaud et al.2014). Several modifications were made to the PEP model, including i) the splitting of China's households into agricultural and non-agricultural households, ii) the introduction of a more flexible way for global investment allocation, iii) the replacement of production nesting structures and production functions with a single level nesting and a translog unit cost function

for all sectors, iv) the introduction of various Chinese agricultural policies, and v) a reformulation of the model as a mixed complimentary problem. The splitting of households into agricultural and non-agricultural households is important for this paper. These households are used as proxies for rural and urban households, respectively, because data availability prevents a direct analysis of a rural/urban split. For this reason, discussion about the modelling results below refers to agricultural/non-agricultural households, whereas discussion about the results' implications for Chinese policies refers to rural/urban households.

The modelling examined various policies, including the existing price floor policies for rice and wheat, deficiency payments, various land subsidies, lump sum transfers, as well as the removal of all policies. A baseline was first developed and the model calibrated to exogenous projections on gross domestic product (GDP), population and other variables to 2050. The baseline is a hypothetical scenario of price floors for corn, rice and wheat (noting that the corn price floor was actually abolished in 2016). Results were reported for the short term (2020), medium term (2025) and long term (2050).

The simulations assessed the performance of each policy on equity measures and efficiency measures. Consideration of equity measures is important, given the Chinese government's stated objectives of advancing the welfare of a specific segment of society. The equity measures are aggregate agricultural household consumption and aggregate non-agricultural household consumption. The efficiency measures are aggregate household consumption and GDP.

The results of Cao et al. are consistent with the economic theory prediction that a removal of distortions leads to efficiency gains (described above). This is shown in Table 1, where the impacts on GDP of the less-distorting policies (in fact, all alternative policies) are better than price floor policies. This principle is also demonstrated in Cao & Greenville (2020), which found that raising tariffs on a large barley exporter (Australia) would cost the Chinese economy nearly $4 billion by 2025. However, on equity grounds, just removing all interventionist policies is a poor choice for the policymaker. This is because agricultural households are made worse off in the short to medium term. The simulation result of a fall in agricultural household consumption (relative to the price floor baseline) runs counter to the Chinese government's objective of improving rural welfare.

Table 1 Modelled scenario results (percentage deviation from baseline)

	2020	2025	2050
Real GDP			
Existing policy	0.000%	0.000%	0.000%
Commodity-specific land subsidy for producers and subsidy for consumers	+0.413%	+0.549%	+0.307%
Non-commodity-specific land subsidy for producers and subsidy for consumers	+0.426%	+0.570%	+0.315%
No producer support, lump sum income transfer to agricultural households	+0.425%	+0.569%	+0.315%
Remove all policies	+0.428%	+0.574%	+0.318%
Consumption – agricultural households			
Existing policy	0.000%	0.000%	0.000%
Commodity-specific land subsidy for producers and subsidy for consumers	−0.417%	−0.488%	+0.263%
Non-commodity-specific land subsidy for producers and subsidy for consumers	−0.395%	−0.454%	+0.301%
No producer support, lump sum income transfer to agricultural households	0.000%	0.000%	0.000%
Remove all policies	−1.475%	−1.759%	+0.245%
Consumption – non-agricultural households			
Existing policy	0.000%	0.000%	0.000%
Commodity-specific land subsidy for producers and subsidy for consumers	+0.514%	+0.654%	+0.217%
Non-commodity-specific land subsidy for producers and subsidy for consumers	+0.525%	+0.673%	+0.221%
No producer support, lump sum income transfer to agricultural households	+0.479%	+0.620%	+0.250%
Remove all policies	+0.653%	+0.825%	+0.230%

In addition to gaining insight on price floor policies, we can also gain insight on China's acreage subsidies. Model results suggest that a move away from price floors (as has already occurred for corn and sugar) to acreage subsidies would be an improvement for GDP. However, compared to the removal of all policies, acreage subsidies are inferior on efficiency grounds, since the subsidies constrain growth in GDP and aggregate household consumption. A move away from price floors to acreage subsidies would be inferior on equity grounds, since non-agricultural households' consumption would fall, although by less than when all policies are removed.

Despite similarities to China's target price policies, Cao et al.'s results for the deficiency payments are unfortunately not of relevance for a realistic analysis of China's policies described above. Under the simulated deficiency payment policy, producers receive the difference between a government chosen price and the market price (similar to China's former target price policy for soybeans, and the current target price policy for cotton in Xinjiang), but this is unanticipated and is received only after production decisions have been made. This means that, in the model, the deficiency payment does not influence the marginal planting decisions of farmers (unlike in reality, where farmers know the policy exists). The unanticipated nature of the deficiency payments in the model explains the relatively strong performance of these policies on both equity and efficiency grounds in the results.

While Chinese agricultural policy has been moving away from the most distortionary domestic and trade policies, the question remains of how Chinese policymakers can simultaneously achieve the dual aims of improving rural welfare and building a prosperous society. The key for the policymaker is to choose a non-distortionary policy. This can be achieved by implementing a

policy strategy that removes all interventions, such as subsidies, taxes, tariffs and TRQs, and pays a lump sum income transfer to agricultural households. This scenario was modelled by Cao et al. in regard to domestic policies. The results for efficiency measures were virtually the same as for the scenario where all policies were removed. This is because, in this scenario, the economy's scarce resources are allocated to the highest value activities, while the incomes of agricultural households are, at a minimum, maintained. The results for equity measures show gains for non-agricultural households that are similar in absolute terms to the 'remove all policies' scenario and zero net change for agricultural households. This means that this policy strategy effectively maintains the income effects of the price floors, while removing their distortionary effects. This outcome resulted in each of the short, medium and long term scenarios.

Conclusion

The Chinese government has dual aims of advancing overall economic welfare (building a 'well-off' society) and advancing rural welfare. This paper has demonstrated that China's current policies achieve the latter while constraining the achievement of the former. CGE modelling results have been used to provide insight on whether China's dual aims are even achievable. The results present a clear picture: overall, the existing policy settings in China have adverse impacts on aggregate consumption and GDP, but they boost agricultural (rural) household consumption. There are better alternatives available to help achieve both policy objectives. Among those policies modelled, the 'removal of all policies' option offers the highest potential economic gains. However, if applied in isolation, it also creates the largest adverse effects on agricultural (rural) households, which would run counter to policy objectives. Such adverse effects can be addressed through a direct lump sum transfer to agricultural (rural) households. The addition of a direct lump sum transfer to the removal of all distortionary policies has limited negative effects on potential efficiency gains. The result is a win-win policy for all households and China overall, which would allow China to have the fish and the bear paw.

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